WHAT IS CLAIMED IS

1. A method for error vector magnitude (EVM) calibration of an OFDM signal transmitter comprising the steps of:

a. providing a separate multi-tone signal with unmodulated carriers; and

b. estimating a multi-tone error vector magnitude of said separate multi-tone signal, whereby said multi-tone error vector magnitude is closely correlated with the OFDM error vector magnitude.

2. The method of claim 1, wherein said step of providing a separate multi-tone signal includes providing a multi-tone signal characterized by a plurality of unmodulated carriers set at OFDM bins frequencies and filling only a portion of said OFDM bins, whereby said separate multi-tone signal thus includes full bins and empty bins.

3. The method of claim 2, wherein the number of said full bins is equal to between 20-30 percent of the number of said OFDM bins.

4. The method of claim 1, wherein said step of providing a separate multi-tone signal further includes transmitting said multi-tone signal from a unit under test (UUT) to a golden unit (GU), and wherein said step of estimating a multi-tone error vector magnitude of said multi-tone signal include estimating from said multi-tone a frequency offset Δf between said UUT and said GU, correcting said frequency offset, performing a FFT operation on a slice of said frequency offset multi-tone, and estimating said EVM from said results of said FFT operation.

5. The method of claim 4, wherein said FFT operation is performed according to $\hat{x}_k = \int_0^{T_s} x(t) \cdot e^{-j2\pi \cdot f_0 \cdot k \cdot t} \cdot e^{-j2\pi \cdot \Delta f \cdot t} dt$, wherein f_0 is an OFDM bin separation related to said symbol length.

6. The method of claim 2, wherein said step of estimating includes estimating an energy ratio between energies associated with said full bins and energies associated with said empty bins according to $EVM = Const \cdot \frac{\sum_{k} |\hat{x}_k|^2}{\sum_{k \in \{\text{multitone bins}\}} |\hat{x}_k|^2}$.

7. The method of claim 1, further comprising the steps of comparing said multi-tone EVM with a specified EVM, and adjusting a transmitter power based on said comparison.

8. The method of claim 2, wherein said full and said empty bins are chosen such that any third order inter-modulation product falls on an empty bin.

9. The method of claim 1, implemented according to the IEEE 802.11a standard.

10. The method of claim 1, further comprising the step of calibrating the OFDM signal EVM based on said multi-tone EVM.

11. A method for estimating the error vector magnitude (EVM) of an OFDM signal comprising the steps of:

a. providing a periodic multi-tone signal that includes a first plurality of full bins and a second plurality of empty bins; and

b. obtaining the EVM of the OFDM signal from an estimation of an EVM of said multi-tone signal.

12. The method of claim 11, wherein said full and said empty bins are chosen such that any third order inter-modulation product falls on an empty bin.

13. The method of claim 11, wherein said periodic multi-tone signal has a period equal to a period of the OFDM signal.

14. The method of claim 11, wherein said first plurality of full bins is equal to between 20-30 percent of the number of OFDM signal bins.

15. The method of claim 11, wherein said estimation of an EVM of said multi-tone signal includes computing an energy ratio between energies associated with said full bins and energies associated with said empty bins according to

$$EVM = Const \cdot \frac{\sum_{k} |\hat{x}_k|^2}{\sum_{k \in \{\text{multitone bins}\}} |\hat{x}_k|^2}.$$

16. The method of claim 15, wherein said step of obtaining the EVM of the OFDM signal further includes subtracting a noise factor from said multi-tone EVM estimate.

17. The method of claim 16, implemented according to the IEEE 802.11a standard.

18. The method of claim 17, wherein said noise factor is 1.76dB.

19. A method for estimating the error vector magnitude (EVM) of an OFDM signal comprising the steps of:

a. obtaining a multi-tone EVM of a separate multi-tone signal; and

b. using said multi-tone EVM to estimate the OFDM EVM.

20. The method of claim 19, wherein said step of obtaining a multi-tone EVM includes:

i. transmitting a multi-tone signal with a given transmitted power from a unit under test to a golden unit;

ii. using said golden unit to estimate and correct a frequency error of said multi-tone signal;

iii. recoding a slice from said multi-tone signal;

iv. performing a transform on said slice; and

v. estimating said multi-tone EVM from the results of said transform.

21. The method of claim 19, wherein said step of using said multi-tone EVM to estimate the OFDM EVM includes comparing said multi-tone EVM to a pre-defined specification, and increasing or decreasing said transmitted power when said multi-tone EVM estimate is above or below the specification, respectively.